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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,643	02/06/2004	Radek P. Chalupa	110348-133035	7622

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EXAMINER	
LEADER, WILLIAM T	
ART UNIT	**PAPER NUMBER**
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,643	CHALUPA ET AL.	
	Examiner	Art Unit	
	William T. Leader	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) *1-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-37,42 and 43* is/are rejected.

7)☒ Claim(s) *38-41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election of claims 35-43 in the reply filed on December 22, 2006, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. The drawings filed on February 6, 2004 are accepted. It is noted that in Fig. 7, in box 116 the word "ration" should apparently be "ratio".

3. The abstract of the disclosure is objected to because it inadequately describes the invention. Correction is required. See MPEP § 608.01(b).

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 35-37, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al (2005/0178667).

7. The Wilson patent is directed to electroplating onto microelectronic devices such as semiconductor devices (paragraph [0003]). Wilson et al state that a challenge of plating uniform layers onto the workpiece is providing a desired electrical field at the surface of the workpiece and recognize that the distribution of electrical current is a function of the seed layer and the resistance of the seed layer (paragraph [0009]). One embodiment of the apparatus utilized by Wilson et al is illustrated in figure 4 and includes a plurality of concentric electrodes 600a, 600b, 600c and 600d. During electroplating these electrodes function as anodes. Wilson et al teach that the current to the electrodes is varied such that the ratio of the current applied to one electrode relative to the currents provided by all the electrodes changes over time (paragraph [0011]). In one embodiment, the current ratio is adjusted between at least two electrodes. In another embodiment, the current ratio is adjusted over four electrodes. The current ratio may be adjusted to maintain a current density across the workpiece that varied by less than 10 percent,

preferably less than 5 percent, of the 3-sigma deviation level of a standard distribution curve. See paragraph [0073].

8. Figures 10A-16 of Wilson et al illustrate predictions and experimental results for plating conductive metals on microelectronic workpieces (paragraph [0076]). Figure 10A illustrates a table of predicted current levels for each of four electrodes 600a-600d as a function of initial seed layer thickness of a 200 mm workpiece (paragraph [0077]). Figure 11 illustrates predicted current levels as a function of time applied to each of electrodes 600a-d by simulating the entire deposition process (paragraph [0080]) while figure 12 illustrates predicted film non-uniformities (paragraph [0091]). Figure 16 shows the results obtained using a three-stage process (paragraph ([0087]).

9. Thus, Wilson et al disclose providing an anode chamber with at least two concentric anodes including an inner and outer anode, selecting a current ratio from a table of simulated current ratios, applying and adjusting current to the anodes in accordance with the simulated values. Claim 35 differs from the process of Wilson et al by reciting that the model was computer generated. Wilson et al show in figure 10A simulated current ratios but do not specifically state that the data was generated by a computer as recited in instant claim 35. The Chen et al patent is directed to a method for electrochemically depositing metal on a semiconductor wafer. Figure 18 illustrates the manner in which the anode configuration may be employed to achieve uniform plating. Chen et al indicate that the data in figure 18 were obtained from computer simulation (column 21, lines 43-46)

10. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized a computer to have generated the simulation data in the process of Wilson et al as taught by Chen et al because the data would have been efficiently calculated. With respect to claim 36, figure 10A shows a plurality of currents resulting in a plurality of current ratios. With respect to claim 42, the apparatus of Wilson et al includes shield 580 which influences the electrical field in the peripheral region. See figure 4 and paragraph [0045]. With respect to claim 43, as noted above, figure 4 of Wilson et al depicts 4 concentric anodes.

11. Claims 38-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not disclose the additional limitations recited in these claims.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

William Leader
March 15, 2007